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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/955,651 | 09/19/2001 | Maxim B. Belotserkovsky | RCA 90334 | 1155 |

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EXAMINER

MEEK, JACOB M

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|----------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/955,651 | BELOTSEKOVSKY ET AL. | |
| | Examiner | Art Unit | |
| | Jacob Meek | 2637 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 6/28/05 have been fully considered but they are not persuasive.

With regard to applicant's argument of claims 1 (and 2 – 5) and 13 (and 14 – 17) regarding Rademacher's ('918) failure to describe an OFDM signal. Examiner notes that Rademacher discloses his system is useful for CDMA applications (see column 5, lines 33 – 39). Examiner further notes that CDMA is a multi-carrier scheme, as is OFDM (see van de Wiel, Adaptive Equalization Structures for Multitone CDMA Systems). Therefore it is deemed that CDMA and OFDM, while differing technologies, are members of the same family and are applicable. Further, Rademacher discusses variations of inhibiting tap updates during different sequences (see column 12, lines 9 – 32, and column 13, lines 23 – 45 where this is interpreted as providing support for intervals by describing different training sequences, and call-by-call functionality). While Examiner acknowledges applicant's argument, it is noted below (see 112, 2nd rejection of claims 1, 13, 21, and 22) that these limitations do not appear to convey any specific boundaries.

With regard to applicant's argument of claim 9 regarding Pollman ('733). First, Pollman's system is a broadband wireless system, as noted by applicant, of which OFDM is a known form (see Clark, Adaptive Frequency-Domain Equalization and Diversity Combining for Braodband Wireless Communications). Turning to applicant's argument regarding time intervals and re-initialization. Pollman describes a process for initializing an equalizer (see column 7, lines 17 – 21) and monitoring the channel response on an on-going basis (see figure 14). Examiner points out that flowchart (figure 14, 2914, 2920, 2922, 2902) shows reuse of equalizer coefficients if it is determined that settings are appropriate (see column 11,

lines 29 – 61). Channel characteristics are understood in the art to drift over time (see Sklar, Digital Communications, page 159), particularly in wireless applications. Examiner interprets Pollman as providing a mechanism for measuring channel drift over time by use of his operation. Also, examiner (see below) is concerned that “predetermined” does not disclose a measurable quantity or operation with which to gauge system functionality.

2. Restatement of rejections in previous office action.

Claims 1 - 5, and 13 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rademacher (US Patent 6,570,918).

With regard to Claim 1, Rademacher teaches a method of initializing an equalizer in a wireless receiver (see column 1, lines 8 – 11) comprising inhibiting an initialization of the 1st tap (see column 12, lines 10 – 32, where several methods are described) during a time window. Rademacher is silent with respect to OFDM but does state that his invention is useful for other modulation schemes (see column 13, lines 53 – 55). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize Rademacher's device to provide an equalizer which could a lower noise adaptation process (see column 13, lines 23 – 35) for use in an OFDM system as this is a well known modulation technique.

With regard to claim 2, Rademacher teaches the enabling of adaptation of 1st tap (see column 10, line 66 – column 11, line 15 where this is interpreted as enabling update of 1st tap).

With regard to claim 3, Rademacher teaches a method of enabling initialization of a second tap (see Column 9, lines 43 – 53 where this is interpreted as equivalent) where the step of initialization of the 2nd tap is simultaneous with enabling the adaptation of the 1st tap (see column 9, line 53 – 55 where the initialization of taps result in an input to adaptation unit).

With regard to claim 4, Rademacher teaches a method by which taps are initialized based on a training sequence (see column 9, lines 43 – 48 where this predetermined sequence is interpreted as a training sequence).

With regard to claim 5, Rademacher teaches a method of adaptation of 1st tap based on data portion of 1st signal (see column 10, lines 43 – 55 where this is interpreted as equivalent).

With regard to claims 13 – 17, the components claimed as apparatus are nothing more than a restating of the embodiment of the method as claimed above and therefore, it would have been obvious, given the aforementioned rejection for the method claims 1 – 5.

Claim 9 - 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pollman et al (US Patent 6,597,733).

With regard to Claim 9, Pollman teaches a method of initializing an equalizer in a wireless receiver (see column 1, lines 8 – 11) comprising initialization of a plurality of taps upon startup (see column 7, lines 4 – 8, where this is interpreted as equivalent), re-initializing the plurality of taps during a time window (see column 7, lines 17-21 where this is interpreted as equivalent), and selectively reinitializing taps based upon a divergence of the tap (see column 7, lines 24 – 30 where this is interpreted as equivalent). Pollman is silent with respect to OFDM but does state that his invention is useful for other modulation schemes (see column 1, lines 53 – 55). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize Pollman's device to provide an equalizer with improved performance (see column 1, lines 28 – 46) for use in an OFDM system as this is a well-known modulation technique.

With regard to claim 10, Pollman teaches a method of initializing an equalizer in a wireless receiver (see column 1, lines 8 – 11) comprising initialization of a plurality of taps based on a training portion of a startup signal(see column 7, lines 11 – 13, where this is interpreted as equivalent), re-initializing the plurality of taps during a time window based on the training portion of a subsequent signal (see column 7, lines 26 -29 where this is interpreted as equivalent), and selectively reinitializing taps based upon a divergence of the tap (see column 12, lines 22 – 26 where this is interpreted as equivalent). Pollman is silent with respect to OFDM but does state that his invention is useful for other modulation schemes (see column 1, lines 53 – 55). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize Pollman's device to provide an equalizer with improved

performance (see column 1, lines 28 – 46) for use in an OFDM system as this is a well-known modulation technique.

With regard to claim 11, Pollman teaches his technique is used for WLAN (see column 1, lines 9 – 11 where this is interpreted as inclusive of WLAN applications).

With regard to claim 12, Pollman teaches a method usable for computer communications (see column 1, lines 13 – 20 and 46 – 53).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 13, 21, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1, 13, 21, and further reading of the limitation “inhibiting, based ... , an initialization of the 1st tap.” Examiner believes that this is attempting to define the inhibition of initialization of a 1st tap of equalizer. Clause (a) is confusing because of statement “a 1st tap”. It is unclear how 1st tap relates to 1st limit. Further, there is no indication as to what the limit is based on (time, voltage, frequency) or the value of 1st limit. Clause (b) specifies a 2nd time limit between 1st and 2nd OFDM signals but fails to specify a range of values associated with 2nd limit. As currently claimed, there not clearly defined limits which allow determination of scope of claims.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 9, the term predetermined time limit does not convey a specific limitation with which to analyze the scope of the claim. Examiner was unable to determine from the specification what the range of values of this limitation is or how to derive it.

Other Cited Prior Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wu (US-6,219,378), Isaksson (US-6,320,903), Vook (US-6,765,969), and Siala (US-6,768,713) all discloses techniques for adaptive equalization in multi-carrier systems. NPL references are furnished to support general knowledge associated with adaptive equalization techniques.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM
9/16/05



JAY K. PATEL
SUPERVISORY PATENT EXAMINER